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(54) Title: POWER SYSTEMS UTILIZING HYDROLYTICALLY GENERATED HYDROGEN

(57) **Abstract:** An apparatus and method for generating hydrogen by hydrolytic reaction and supplying the hydrogen to a user device, such as a fuel cell. Water is selectively supplied to a reactor vessel containing supply of an aluminum composite reactive material to produce the hydrolytic reaction. Hydrogen from the reaction vessel is supplied to at least one metal hydride buffer vessel at a relatively high pressure, and is released from the buffer vessel to the user device at a relatively low pressure. In the case of fuel cells, the relatively low pressure is less than the maximum allowable supply pressure of the cell, obviating potential damage thereto. The hydrogen flow may be switched alternately between a plurality of buffer vessels, so that one vessel is being charged at the relatively higher pressure while the other is releasing hydrogen to the fuel cell at the relatively low pressure. Water may be supplied to the reactor vessel to produce the reaction in response to a demand for hydrogen from the fuel cell or other user device. The demand for hydrogen may be detected by sensing a pressure drop in the hydrogen flow to the user device. There may also be a plurality of reactor vessels, with the water supply being controllable on a separate basis so that hydrogen can be generated from the vessels in a sequential, staged or phased manner.

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